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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/800,905	03/15/2004	Dana Alexa Totir	08935-270001	1479
26161	7590	12/04/2007		
FISH & RICHARDSON PC P.O. BOX 1022 MINNEAPOLIS, MN 55440-1022			EXAMINER ALEJANDRO, RAYMOND	
			ART UNIT 1795	PAPER NUMBER
			MAIL DATE 12/04/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/800,905

Applicant(s)

TOTIR ET AL.

Examiner

Raymond Alejandro

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 November 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5, 8-12, 14-24, 28-35, 39-43 and 45-54 is/are pending in the application.
- 4a) Of the above claim(s) 29, 30 and 47-54 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 8-12, 14-24, 28, 31-35, 39-43, 45 and 46 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

This office action is responsive to the amendment filed 11/27/07. The applicant has overcome all grounds of rejections. Refer to the abovementioned amendment for specific details on applicant's rebuttal arguments and remarks. However, the present claims are again rejected over new grounds of rejection as posited infra on the written record. Therefore, prosecution on the merits of this application is reopened on all previously rejected claims considered unpatentable for the reasons indicated below:

Election/Restrictions and Claim Disposition

1. Claims 29-30 and 47-54 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention and/or species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 03/16/07.
2. Claims 6-7, 13, 25-27, 36-38 and 44 were cancelled previously.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various

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claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1-5, 8, 14-20 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Birke-Salam et al 2003/0113637 in view of Krause et al 5691081.

As to claims 1-2, 17-18 and 31-32 (see specific rejections for claims 31-32 in items 6-7 below):

Birke-Salam et al teach an electrochemical galvanic element (*the electrochemical cell*) having a liquid organic electrolyte (TITLE/ABSTRACT) including electrodes inserted into a battery housing (P0003), thereby forming a primary electrochemical system (P0004) employing a Li-metal as the anode, a MnO₂ based cathode, and an electrolyte comprising a Li-salt dissolvent in an organic solvent mixture (P0004 & 0014/ P0019 or See EXAMPLE). Birke-Salam et al teach a copper housing (*the second metal surface*) (P0019 or See EXAMPLE).

Birke-Salam et al also use a positive electrode foil (metallic conductor) for supporting the cathode active material (P0015 & 0018).

Birke-Salam et al disclose the use of electrically conductive salts such as lithium-bis(oxalato)borate (P0011 & CLAIM 13).

As to claims 3-4 and 28:

Birke-Salam et al contemplate the use of more than one Li-salt such as LiClO₄, LiCF₃SO₃ (Li-trifluoromethane sulfonate) (P0004) and other electrically conductive salts such as lithium-bis(oxalato)borate and Li-trifluorotri(pentafluoroethyl)phosphate (P0011 & CLAIM 13).

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Concerning claims 19-20:

A Li-metal as the anode and a MnO_2 based cathode are disclosed (P0004 & 0014/ P0019 or See EXAMPLE).

Birke-Salam et al disclose a Li-based electrochemical galvanic element as described above. However, the preceding reference does not expressly disclose the Al current collector (the Al surface) and its dimension; and the steel surface.

Concerning claims 1, 8 and 14-17:

Krause et al disclose lithium-based batteries (TITLE) including either primary or secondary batteries (COL 7, lines 55-58) comprising a Li-anode (COL 7, lines 34-40) and a cathode containing at least manganese (COL 7, lines 34-55); an electrolyte containing Li-salt in an amount ranging from at least 0.1 M (COL 6, lines 57-63/COL 5, line 20-26) and an aluminum cathode current collector having a thickness of 0.51 mm (COL 12, lines 53-55/CLAIM 1/Abstract/COL 1, lines 15-22 & lines 60-61).

Concerning claim 5:

Krause et al use a steel-based materials such as chromium steel and stainless steel as the cell can 10 (Col 12, lines 54-60).

Based on the aforementioned, it would have been obvious to a skilled artisan at the time the invention was made to use the specific Al current collector and its dimension of Krause et al in any one of the cell battery of Birke-Salam et al as Krause et al disclose that batteries comprising the specific Al current collector (Al-surface portion) having the specified dimension exhibits high voltages and optimal performance characteristics such as unrestricted operating temperature ranges, suitable discharge/charge rates and adequate cycling performance,

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particularly when Al components are used. *Moreover, where the only difference between the prior art and the claims is a recitation of relative dimensions (i.e. changes in size/proportion) of the claimed feature and a feature having the claimed relative dimensions would not perform differently than the prior art device/element/member, the claimed device/element/member is not patentably distinct from the prior art device//element/member. That is, limitations relating to the size of the feature/element/member are not sufficient to patentably distinguish over the prior art as it is noted that changes in size is a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular size or dimension of the claimed Al portion is significant. In re Rose 105 USPQ 237; In re Rinehart 189 USPQ 143; In Gardner v. TEC Systems, Inc., 220 USPQ 777 & 225 USPQ 232, (See MPEP 2144.04 [R-1] Legal Precedent as Source of Supporting Rationale).*

With regards to the steel surface, it would have been obvious to a person of ordinary skill at the time of invention to use the steel-based material of Krause et al to make the housing (the cell can) of Birke-Salam et al because Krause et al teach that such a housing material is an effective material to contain or enclose battery components as it is adaptable to the battery chemical environment, and is easy to be sealed. *In this respect, the claim would have been obvious because the substitution of one known element (one metal based housing element) for another (other metal based housing element) would have yielded predictable results to one of ordinary skill in the art at the time of the invention. Stated differently, simple substitution of one known, equivalent element for another to obtain predictable results is prima-facie obvious. KSR International Co. v. Teleflex Inc., 550 US- 82 USPQ2d 1385, 1396 (2007). The predictable result of using the steel-based housing material of Krause et al as the housing material in the battery of*

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Birke-Salam et al is that it is an effective material for housing battery components under the battery's specific chemical environment.

6. Claims 9-12, 21-24 and 31-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Birke-Salam et al 2003/0113637 in view of Krause et al 5691081 as applied to claims 1 and 17 above, and further in view of Amine et al 2005/0019670.

Birke-Salam et al and Krause et al are applied, argued and incorporated herein for the reasons discussed above. (*Note: the limitations of claims 31-32 have been addressed above*).

Nonetheless, none of the foregoing references expressly suggest the specific Li-salt concentration/amount.

Amine et al disclose Li-based batteries (TITLE) using lithium- bis(oxalato)borate (LiBOB) in a specified amount (P0018). Amine et al disclose Li-based batteries (TITLE) using LiBOB in an amount ranging from .0005 to about 2 wt % (P0012), specifically in an amount of 0.005 % % (P0018).

In view of the above, it would have been obvious to a skilled artisan at the time the invention was made to use the specific Li-salt [bis(oxalate)borate salt] in the disclosed amount of Amine et al in the battery of Birke-Salam et al-Krause et al as Amine et al teach when the specified Li-salt is used in the disclosed amount the cell shows better capacity retention than other cell system using other Li-salt additives. Further, the specified Li-salt, when used in the disclosed amount, have the ability to passivate the surfaces of both the anode and the cathode, thereby enhancing the capacity retention of both electrodes. This provides strong protection against the surface reaction that may otherwise lead to an increase in interfacial resistance and

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fading of both the capacity and the power of cell. Generally speaking, differences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical.

“[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.” In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). Thus, it is prima-facie obvious to choose or select the specific amount of the Li-salt. *See MPEP 2144.05 Obviousness of Ranges.*

7. Claims 9-12, 21-24 and 31-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Birke-Salam et al 2003/0113637 in view of Krause et al 5691081 as applied to claims 1 and 17 above, and further in view of Wietelmann et al 6506516.

Birke-Salam et al and Krause et al are applied, argued and incorporated herein for the reasons discussed above. (*Note: the limitations of claims 31-32 have been addressed above*).

Nonetheless, none of the foregoing references expressly suggest the specific Li-salt concentration/amount.

As to claims 39, 41-43 and 45:

Wietelmann et al disclose the use of Li-bisoxalatoborate as a conducting salt in Li-based batteries (Title/Abstract/COL 1, lines 5-9/CLAIM 14/Examples 1-6). Wietelmann et al disclose using the disclosed salt in an amount of 0.56 m (Col 2, lines 36-50) to achieve certain degree of conductivity (COL 2, lines 36-50/Examples 1-6).

In view of the above, it would have been obvious to a skilled artisan at the time the invention was made to use the specific Li-salt [bis(oxalate)borate salt] of Wietelmann et al in the

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battery of Birke-Salam et al-Krause et al as Wietelmann et al teach that such a Li-salt is used as a conducting salt to enhance the conductivity in battery cells while being easily soluble in aprotic solvents; thereby, leading to electrolytes having high conductivities. With particular respect to the specific amount of Li-salt, it would have been obvious to a person of skill in the art at the time the invention was made to employ the specific molar amount of the Li-salt as instantly claimed or any other amount thereof in the battery of Birke-Salam et al-Krause et al as Wietelmann et al themselves disclose that molar amount of the Li-salt are varied or adjusted to achieve predetermined degrees of conductivity of the electrolyte containing the Li-salt (See COL 2, lines 35-63 of Wietelmann et al. Therefore, Wietelmann et al recognize the specific molar amount of the Li-salt as a variable that achieves a recognized result (i.e. molar amount or concentration of Li-salt being varied or adjusted to change degree of conductivity) *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). See also *Peterson*, 315 F.3d at 1330, 65 USPQ2d at 1382; and *In re Hoeschele*, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969). Generally speaking, differences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical. “[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.” *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). Thus, it is prima-facie obvious to choose or select the specific amount of the Li-salt. *See MPEP 2144.05 Obviousness of Ranges.*

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8. Claims 39-43 and 45-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Birke-Salam et al 2003/0113637 in view of Amine et al 2005/0019670.

As to claims 39-40 and 45-46:

Birke-Salam et al teach an electrochemical galvanic element (*the electrochemical cell*) having a liquid organic electrolyte (TITLE/ABSTRACT) including electrodes inserted into a battery housing (P0003), thereby forming a primary electrochemical system (P0004) employing a Li-metal as the anode, a MnO₂ based cathode, and an electrolyte comprising a Li-salt dissolvent in an organic solvent mixture (P0004 & 0014/ P0019 or See EXAMPLE). Birke-Salam et al teach a copper housing (*the second metal surface*) (P0019 or See EXAMPLE).

Birke-Salam et al also use a positive electrode foil (metallic conductor) for supporting the cathode active material (P0015 & 0018).

Birke-Salam et al disclose the use of electrically conductive salts such as lithium-bis(oxalato)borate (P0011 & CLAIM 13) wherein the concentration of Li-salt is 0.96M (P0019).

Birke-Salam et al disclose a Li-based electrochemical galvanic element as described above. However, the preceding reference does not expressly disclose the specific Li-salt concentration or amount.

As to claims 39, 41-43 and 45:

Amine et al disclose Li-based batteries (TITLE) using lithium- bis(oxalato)borate (LiBOB) in a specified amount (P0018). Amine et al disclose Li-based batteries (TITLE) using LiBOB in an amount ranging from .0005 to about 2 wt % (P0012), specifically in an amount of 0.005 % % (P0018).

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In view of the above, it would have been obvious to a skilled artisan at the time the invention was made to use the specific Li-salt [bis(oxalate)borate salt] in the disclosed amount of Amine et al in the battery of Birke-Salam et al as Amine et al teach when the specified Li-salt is used in the disclosed amount the cell shows better capacity retention than other cell system using other Li-salt additives. Further, the specified Li-salt, when used in the disclosed amount, have the ability to passivate the surfaces of both the anode and the cathode, thereby enhancing the capacity retention of both electrodes. This provides strong protection against the surface reaction that may otherwise lead to an increase in interfacial resistance and fading of both the capacity and the power of cell. Generally speaking, differences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical. “[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.” *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). Thus, it is prima-facie obvious to choose or select the specific amount of the Li-salt. *See MPEP 2144.05 Obviousness of Ranges*.

9. Claims 39-43 and 45-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Birke-Salam et al 2003/0113637 in view of Wietelmann et al 6506516.

As to claims 39-40 and 45-46:

Birke-Salam et al teach an electrochemical galvanic element (*the electrochemical cell*) having a liquid organic electrolyte (TITLE/ABSTRACT) including electrodes inserted into a battery housing (P0003), thereby forming a primary electrochemical system (P0004) employing

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a Li-metal as the anode, a MnO_2 based cathode, and an electrolyte comprising a Li-salt dissolvent in an organic solvent mixture (P0004 & 0014/ P0019 or See EXAMPLE). Birke-Salam et al teach a copper housing (*the second metal surface*) (P0019 or See EXAMPLE).

Birke-Salam et al also use a positive electrode foil (metallic conductor) for supporting the cathode active material (P0015 & 0018).

Birke-Salam et al disclose the use of electrically conductive salts such as lithium-bis(oxalato)borate (P0011 & CLAIM 13) wherein the concentration of Li-salt is 0.96M (P0019).

Birke-Salam et al disclose a Li-based electrochemical galvanic element as described above. However, the preceding reference does not expressly disclose the specific Li-salt concentration or amount.

As to claims 39, 41-43 and 45:

Wietelmann et al disclose the use of Li-bisoxalatoborate as a conducting salt in Li-based batteries (Title/Abstract/COL 1, lines 5-9/CLAIM 14/Examples 1-6). Wietelmann et al disclose using the disclosed salt in an amount of 0.56 m (Col 2, lines 36-50) to achieve certain degree of conductivity (COL 2, lines 36-50/Examples 1-6).

In view of the above, it would have been obvious to a skilled artisan at the time the invention was made to use the specific Li-salt [bis(oxalate)borate salt] of Wietelmann et al in the battery of Birke-Salam et al as Wietelmann et al teach that such a Li-salt is used as a conducting salt to enhance the conductivity in battery cells while being easily soluble in aprotic solvents; thereby, leading to electrolytes having high conductivities. With particular respect to the specific amount of Li-salt, it would have been obvious to a person of skill in the art at the time the invention was made to employ the specific molar amount of the Li-salt as instantly claimed or

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any other amount thereof in the battery of Birke-Salam et al as Wietelmann et al themselves disclose that molar amount of the Li-salt are varied or adjusted to achieve predetermined degrees of conductivity of the electrolyte containing the Li-salt (See COL 2, lines 35-63 of Wietelmann et al. Therefore, Wietelmann et al recognize the specific molar amount of the Li-salt as a variable that achieves a recognized result (*i.e. molar amount or concentration of Li-salt being varied or adjusted to change degree of conductivity*) *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). See also *Peterson*, 315 F.3d at 1330, 65 USPQ2d at 1382; and *In re Hoeschele*, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969). Generally speaking, differences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical. “[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.” *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). Thus, it is prima-facie obvious to choose or select the specific amount of the Li-salt. *See MPEP 2144.05 Obviousness of Ranges*.

Response to Arguments

10. Applicant's arguments with respect to all pending claims have been considered but are moot in view of the new ground(s) of rejection.

11. All pending claims have been rejected hereinbefore in view of the newly discovered reference(s). To that end, prosecution on the merits of this application is reopened on those claims.

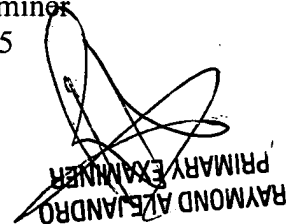
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Raymond Alejandro whose telephone number is (571) 272-1282. The examiner can normally be reached on Monday-Thursday (8:00 am - 6:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Raymond Alejandro
Primary Examiner
Art Unit 1795



RAYMOND ALEJANDRO
PRIMARY EXAMINER